What is claimed is:

1. A method for reducing linewidth variation in a photoresist adapted to be developed by actinic radiation at 248 nm or less, the method comprising the step of

providing a photoresist composition that includes a photoresist polymer, a photoacid generator and a base, a molar concentration ratio of the base relative to the photoacid generator being at least 0.2 in order to buffer acid generated by the photoacid generator upon exposure of the composition to actinic radiation.

2. The method of claim 1, wherein the molar concentration ratio of the base relative to the photoacid generator is selected to be at least about 0.4.

3. The method of claim 1, wherein the molar concentration ratio of the base relative to the photoacid generator is selected to be about 0.6.

4. The method of claim 1, wherein the molar concentration ratio of the base relative to the photoacid generator is selected to be less than about 1.0.

5. The method of claim 1, wherein the base is selected from the group consisting of tetramethylammonium hydroxide, tetrabutylammonium hydroxide, tetraethanol ammonium hydroxide, 1,4-diazabicylo[2.2.2]octane, 1,5-diazabicyclo[4.3.0]non-5-ene, diazabicyclo[5.4.0]undec-7-ene, triphenyl amine, diphenyl amine, trioctyl amine, triheptyl amine, hexamethylenetetramine, hexamethylenetriethylenetetramine, N-diethyl-N'methylenediamine, 4-aminophenol, and 2-(4-aminophenyl)-2-(4-hydroxyphenyl)propane.

6. The method of claim 1, wherein the photoacid generator is selected from the group consisting of di-t-butylphenyl iodonium camphor sulfonate, t-butylphenyl iodonium perfluorobenzo sulfonate, t-butylphenyl iodonium trifluoromethyl sulfonate, t-butylphenyl iodonium perfluorooctyl sulfonate, t-butylphenyl iodonium perfluorobutyl sulfonate, tri-t-butylphenyl sulfonium camphor sulfonate, N-camphorsulfonyloxybicyclo[2.2.1]hept-5-ene-2,3-dicarboximide and N-camphorsulfonyloxy-1,8-naphthalimide.

7. The method of claim 1, wherein the concentration of the base is selected to increase as the concentration of the photoacid generator increases.

8. A photoresist having micron or submicron linewidth variation when developed by radiation having a wavelength of about 248 nm or less, comprising

a polyhydroxystyrene based polymer, a photoacid generator and a base having a molar concentration ratio of at least about 0.2 relative to the photoacid generator..

9. The photoresist of claim 8, wherein the molar concentration ratio of the base relative to the photoacid generator is at least about 0.4.

10. The photoresist of claim 8, wherein the molar concentration ratio of the base relative to the photoacid generator is at least about 0.6.

11. The photoresist of claim 8, wherein the molar concentration ratio of the base relative to the photoacid generator is less than about 1.0.

12. The photoresist of claim 8, wherein the base is selected from the group consisting of tetramethylammonium hydroxide, tetrabutylammonium hydroxide, tetraethanol ammonium hydroxide, 1,4-diazabicylo[2.2.2]octane, 1,5-diazabicyclo[4.3.0]non-5-ene, diazabicyclo[5.4.0]undec-7-ene, triphenyl amine, diphenyl amine, trioctyl amine, triheptyl amine, hexamethylenetetramine, hexamethylenetriethylenetetramine, N-diethyl-N'methylenediamine, 4-aminophenol, and 2-(4-aminophenyl)-2-(4-hydroxyphenyl)propane .

13. The photoresist of claim 8, wherein the photoacid generator is selected from the group consisting of di-t-butylphenyl iodonium camphor sulfonate, t-butylphenyl iodonium perfluorobenzo sulfonate, t-butylphenyl iodonium trifluoromethyl sulfonate, t-butylphenyl iodonium perfluorooctyl sulfonate, t-butylphenyl iodonium perfluorobutyl sulfonate, tri-t-butylphenyl sulfonium camphor sulfonate, N-camphorsulfonyloxybicyclo[2.2.1]hept-5-ene-2,3-dicarboximide and N-camphorsulfonyloxy-1,8-naphthalimide.

14. The photoresist of claim 8, wherein the polyhydroxystyrene based polymer is a copolymer or a terpolymer.

15. The photoresist of claim 14, wherein the copolymer or the terpolymer includes an acid labile protecting group.

16. The photoresist of claim 15, wherein the acid labile protecting group is any of a t-butyl ester, an acetal or a ketal.

17. A photoresist having micron or submicron linewidth variation when developed at a photoenergy of about 248 nm or less, comprising

a polyacrylate or a polymethacrylate based polymer, a photoacid generator and a base having a molar concentration ratio of at least about 0.2 relative to the photoacid generator.

18. A photoresist having micron or submicron linewidth variation when developed by radiation having a wavelength of about 248 nm or less, comprising a polycyclic copolymer, a photoacid generator and a base having a molar concentration ratio of at least about 0.2 relative to the photoacid generator.

19. A photoresist composition, comprising

a photoresist polymer,

a photoacid generator, and

a base additive,

wherein the base has a concentration sufficient to buffer acid generated by the photoacid generator upon exposure of the composition to radiation having a wavelength of less than about 248 nm, thereby providing a photoresist with reduced linewidth variation.

20. A photoresist having micron or submicron linewidth variation when developed by radiation having a wavelength of about 248 nm or less, comprising

a cycloolefin based polymer or copolymer, a photoacid generator and a base having a molar concentration ratio of at least about 0.2 relative to the photoacid generator.

21. The photoresist of claim 20, wherein the molar concentration ratio of the base relative to the photoacid generator is at least 0.4.

22. The photoresist of claim 20, wherein the molar concentration ratio of the base relative to the photoacid generator is at least about 0.6.

23. The photoresist of claim 20, wherein the molar concentration ratio of the base relative to the photoacid generator is less than about 1.

24. The photoresist of claim 20, wherein the cycloolefin based polymer or copolymer is a cycloolefin-maleic anhydride copolymer.

25. A photoresist having micron or submicron linewidth variation when developed by radiation having a wavelength of about 248 nm or less, comprising

a polymer or copolymer containing fluorinated alcohol substituted polycyclic ethylinically unsaturated monomeric unit, a photoacid generator and a base having a molar concentration ratio of at least about 0.2 relative to the photoacid generator.

26. The photoresist of claim 25, wherein the molar concentration ratio of the base relative to the photoacid generator is at least 0.4.

27. The photoresist of claim 25, wherein the molar concentration ratio of the base relative to the photoacid generator is at least about 0.6.

28. The photoresist of claim 25, wherein the molar concentration ratio of the base relative to the photoacid generator is less than about 1.

29. A photoresist having micron or submicron linewidth variation when developed by radiation having a wavelength of about 248 nm or less, comprising

a polymer or copolymer containing at least one alcohol functional group attached to an aromatic moiety, a photoacid generator and a base having a molar concentration ratio of at least about 0.2 relative to the photoacid generator.

30. The photoresist of claim 29, wherein the molar concentration ratio of the base relative to the photoacid generator is at least 0.4.

31. The photoresist of claim 29, wherein the molar concentration ratio of the base relative to the photoacid generator is at least about 0.6.

32. The photoresist of claim 29, wherein the molar concentration ratio of the base relative to the photoacid generator is less than about 1.

33. A method of generating sub-micron patterns having line edge roughness (LER) less than about 10 nanometers on a substrate, the method comprising the steps of:

applying a film of a photoresist composition to a selected portion of the substrate, the photoresist composition including a photoresist polymer, a photoacid generator and a base having a molar concentration ratio of at least 0.2 relative to the photoacid generator, and

exposing said film to actinic radiation having a wavelength of approximately 248 nm to generate said pattern,

wherein the base buffers acid generated by the photoacid generator upon exposure to the radiation to ensure an LER less than about 10 nanometers.

34. The method of claim 33, wherein the molar concentration ratio of the base relative to the photoacid generator is selected to be at least about 0.4.

35. The method of claim 33, wherein the molar concentration ratio of the base relative to the photoacid generator is selected to be at least about 0.6.

36. The method of claim 33, wherein the molar concentration ratio of the base relative to the photoacid generator is selected to be less than about 1.

37. A method of generating sub-micron patterns having line edge roughness (LER) less than about 10 nanometers on a substrate, the method comprising the steps of:

applying a film of a photoresist composition to a selected portion of the substrate, the photoresist composition including a photoresist polymer, a photoacid generator and a base having a molar concentration ratio of at least 0.2 relative to the photoacid generator, and

exposing said film to actinic radiation having a wavelength of approximately 193 nm to generate said pattern,

wherein the base buffers acid generated by the photoacid generator upon exposure to the radiation to ensure an LER less than 10 nanometers.

38. The method of claim 37, wherein the molar concentration ratio of the base relative to the photoacid generator is selected to be at least about 0.4.

39. The method of claim 37, wherein the molar concentration ratio of the base relative to the photoacid generator is selected to be at least about 0.6.

40. The method of claim 37, wherein the molar concentration ratio of the base relative to the photoacid generator is selected to be less than about 1.

41. A method of generating sub-micron patterns having line edge roughness (LER) less than about 10 nanometers on a substrate, the method comprising the steps of:

applying a film of a photoresist composition to a selected portion of the substrate, the photoresist composition including a photoresist polymer, a photoacid generator and a base having a molar concentration ratio of at least 0.2 relative to the photoacid generator, and

exposing said film to actinic radiation having a wavelength of approximately 157 nm to generate said pattern,

wherein the base buffers acid generated by the photoacid generator upon exposure to the radiation to ensure an LER less than 10 nanometers.

42. The method of claim 41, wherein the molar concentration ratio of the base relative to the photoacid generator is selected to be at least about 0.4.

43. The method of claim 41, wherein the molar concentration ratio of the base relative to the photoacid generator is selected to be at least about 0.6.

44. The method of claim 41, wherein the molar concentration ratio of the base relative to the photoacid generator is selected to be less than about 1.

45. A method of generating sub-micron patterns having line edge roughness (LER) less than about 10 nanometers on a substrate, the method comprising the steps of:

applying a film of a photoresist composition to a selected portion of the substrate, the photoresist composition including a photoresist polymer, a photoacid generator and a base having a molar concentration ratio of at least 0.2 relative to the photoacid generator, and

exposing said film to actinic radiation having a wavelength of approximately 14 nm to generate said pattern,

wherein the base buffers acid generated by the photoacid generator upon exposure to the radiation to ensure an LER less than 10 nanometers.

46. The method of claim 45, wherein the molar concentration ratio of the base relative to the photoacid generator is selected to be at least about 0.4.

47. The method of claim 45, wherein the molar concentration ratio of the base relative to the photoacid generator is selected to be at least about 0.6.

48. The method of claim 45, wherein the molar concentration ratio of the base relative to the photoacid generator is selected to be less than about 1.

49. A method of generating sub-micron patterns having line edge roughness (LER) less than about 10 nanometers on a substrate, the method comprising the steps of:

applying a bilayer film to a selected portion of the substrate, an upper layer of the bilayer film including a photoresist polymer, a photoacid generator and a base having a molar concentration ratio of at least 0.2 relative to the photoacid generator,

exposing said upper layer to actinic radiation to generate a selected pattern thereon, and

transferring said selected pattern to a lower layer of the film by utilizing a plasma etching process.